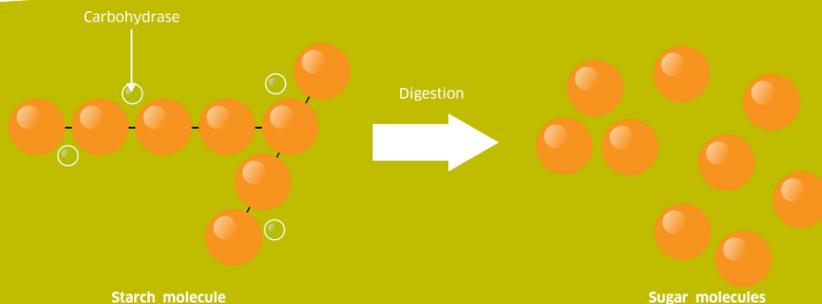


THE SCIENCE BEHIND THE SHOW

The body needs energy to function. Our bodies get energy from our food, mostly in the form of glucose. Glucose is absorbed in the small intestine and is required by our cells to produce energy for cellular functions.



The body can obtain glucose from food that contains glucose, or food that contains starchy carbohydrates which the body can digest into glucose. Starchy carbohydrates are found in foods such as pasta, rice, bread and potato. We get most of our glucose, and therefore our energy, from starchy carbohydrates.

Once glucose is absorbed into our blood, insulin is required to move the glucose into our cells. Insulin is a hormone produced by the pancreas. It is released in response to increased glucose levels in the blood. Insulin is the key that unlocks the door to the body's cells, allowing glucose to enter and produce energy. As is happening in the right hand diagram below.

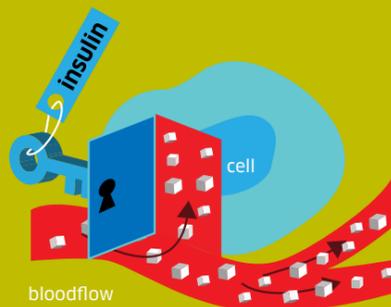
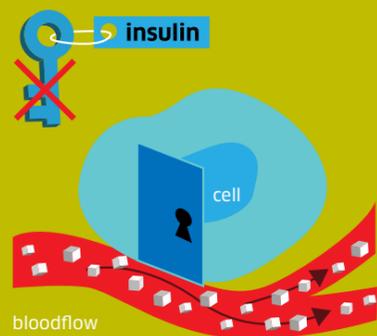
Diabetes is a condition where the amount of glucose in your blood is too high because your body cannot use it properly. In the long term, too much glucose in your blood increases risk of heart disease, blindness, kidney disease and nerve damage which can lead to amputation. There are two main types of diabetes.

Type 1 diabetes occurs when insulin-producing cells in the body are destroyed and the body is unable to produce any insulin. The absence of insulin, as in the left hand diagram below, means that glucose cannot move into cells and glucose levels in the blood increase.

Nobody knows for sure why these insulin-producing cells are destroyed. Type 1 diabetes can develop at any age but usually appears before the age of 40, and especially in childhood. Type 1 diabetes cannot be prevented and it accounts for between 5 and 15 per cent of all people with diabetes. It is treated by daily insulin injections, a healthy diet and regular physical activity. Children with Type 1 diabetes will have a care plan in place.

Type 2 diabetes develops when the body cannot make enough insulin, or when the insulin that is produced does not work properly. If there is not enough insulin, or it is not working properly, the cells are only partially unlocked (or not at all) and glucose builds up in the blood.

The risk factors for developing Type 2 diabetes include age, ethnicity, weight and having a family history of Type 2 diabetes but it is becoming more common in children and young people. It accounts for between 85 and 95 per cent of all people with diabetes and is treated with a healthy diet and increased physical activity. In addition to this, medication and/or insulin can be required. Up to 80% of Type 2 diabetes cases can be prevented and risk can be reduced by up to 60% after making some basic lifestyle changes.



EDINBURGH INTERNATIONAL
science
festival

GO FOR IT!

WELCOME TO LIVE FOR IT!

Brought to you by Edinburgh International Science Festival and Diabetes UK Scotland, Live for It! is a programme of workshops and activities designed to help students make healthy lifestyle choices now and in the future.



WHAT WE DO

Each workshop is fully equipped and delivered by trained science communicators. We create fun, interactive environments where everyone gets out of their seats and gets involved. Our inspiring demonstrations and engaging activities are linked to the Curriculum for Excellence, explaining key concepts in a unique and memorable way.

EVENT DESCRIPTION

Go for It! is the second workshop in the Live for It! series which explores how our bodies use glucose for energy. Pupils investigate how our bodies use glucose, run their own tests for glucose in food samples and find out how diabetes is diagnosed. Go for It! builds on the knowledge gained from Eat for It! and aims to raise awareness and understanding of diabetes.

CURRICULUM LINKS

Go for It! complements the following experiences and outcomes:

SCN 2-12a: By investigating body systems and potential problems which they may develop, I can make informed decisions to help me to maintain my health and wellbeing.

SCN 3-12a: I have explored the structure and function of organs and organ systems and can relate this to the basic biological processes required to sustain life.

SCN 3-12b: I have explored the role of technology in monitoring health and improving the quality of life.

HWB 2-28a & 3-28a: I can explain the links between the energy I use while being physically active, the food I eat and my health and wellbeing.

HWB 2-15a & 3-15a: I am developing my understanding of the human body and can use this knowledge to maintain and improve my wellbeing and health.

HWB 3-31a: Through practical activities using different foods and drinks, I can identify key nutrients, their sources and functions, and demonstrate the links between energy, nutrients and health.

HWB 3-22a: I am developing my understanding of the nutritional needs of people who have different conditions and requirements.

LEARNING OUTCOMES

- Describe why our bodies require energy
- Recall that different processes require different amount of energy
- Describe that the body burns glucose to provide it with energy
- Describe that glucose is produced by digestion of carbohydrates like starch
- Identify that insulin works to open cells and let glucose in
- Recall what happens in the body during Type 1 and Type 2 diabetes
- Discuss the risks which increase the chances of developing Type 2 diabetes

USEFUL LINKS:

www.diabetes.org.uk/the4ts
www.diabetes.org.uk/Guide-to-diabetes/

Live for it! has been developed by Edinburgh International Science Festival with support from Diabetes UK Scotland

www.sciencefestival.co.uk/education

DIABETES UK
CARE. CONNECT. CAMPAIGN.
SCOTLAND

GUESS MY MOVES

You will need:

Index cards with physical activities written on them such as those below:

| | | | |
|-----------------------|------------------------|------------------|--------------------|
| Walking the dog | Sweeping | Roller skating | Table tennis |
| Running | Hiking | Riding a scooter | Karate |
| Stretching | Basketball | Swimming | Hockey |
| Tennis | Playing musical chairs | Washing the car | Gymnastics |
| Playing hide-and-seek | Dancing | Ice skating | Skiing |
| Football | Bicycle riding | Volleyball | Playing on a swing |



WHAT TO DO:

1. Split the class into two teams, Team A and Team B.
2. Each team sits separately facing the front of the classroom.
3. Place the pile of index cards at the front of the classroom.
4. The first student from Team A comes to the front of the room, takes a card and acts out the physical

activity (the option to draw can also be included). Team A have 30-45 seconds to guess the answer. If Team A cannot answer, Team B get a turn.

5. Once the answer has been guessed, play passes to the other team.
6. Alternate turns until all the cards are used or all pupils have had a turn.

DISCUSSION IDEAS

- Discuss what was similar about all the activities. They were all things that require you to be physically active.
- Discuss why physical activity is important to a healthy lifestyle.

WHAT IS HAPPENING?

Physical activity is an important part of healthy lifestyle. Our bodies use the energy we gain from food to help us perform physical activity and live our lives. If our bodies take in more energy than they use the unused energy is stored as fat.

One of the easiest ways to be physically active every day is to be active in ways you enjoy. The more fun you're having, the more likely you are to do it over and over again. Playing a sport, playing at lunchtime, walking the dog or helping around the house are all physical activities and they all add up.

RAISING AWARENESS OF DIABETES

Diabetes is a common life-long health condition. It occurs when the amount of glucose in your blood is too high because the body cannot use it properly. This is because the pancreas does not produce any or enough insulin, or because your body is not responding properly to insulin.

During Go for It! pupils were introduced to diabetes. Exploring diabetes with your class can help to raise awareness and understanding of the condition.

Ideas to investigate:

- Investigate the differences between Type 1 and Type 2 diabetes.
- Find out about some of the ways diabetes is treated.
- Undertake a survey across the school to find out how many people have relatives with diabetes.
- Think about what it might be like to live with diabetes or if you know someone with diabetes, ask them what it's like.



RAISE AWARENESS OF DIABETES

IN YOUR SCHOOL

No-one yet knows the real causes of Type 1 diabetes. Scientists think it may be caused by a combination of genetic and environmental factors. The risk factors of developing Type 2 diabetes include family history, age, ethnicity and weight. Type 1 diabetes cannot be prevented, however 80% of cases of Type 2 diabetes are preventable. Over 2 million people in the UK have been diagnosed with diabetes, that's about 3 in every 100 people.



Diabetes affects people of all ages and can develop at any age. Raise awareness of diabetes and healthy lifestyle choices in your school by creating posters or pamphlets on:

- The symptoms of Type 1 and Type 2 diabetes.
- The differences between Type 1 and Type 2 diabetes.
- The risk factors for Type 2 diabetes.
- The importance of healthy lifestyle choices.

Diabetes UK has a large number of resources aimed at raising awareness and understanding of diabetes which you can use to help you get started.

diabetes.org.uk/the4ts
diabetes.org.uk/Guide-to-diabetes

